

WHAT IS CLAIMED IS:

1 1. A cell culture of propagating pancreatic cells, wherein at least 50% of
2 the cells exhibit CD56 as a cell surface marker and have an insulin:actin mRNA ratio less
3 than 1:1.

1 2. The cell culture of claim 1, wherein at least 70% of the cells exhibit
2 CD56 as a cell surface marker and have an insulin:actin mRNA ratio less than 1:1.

1 3. The cell culture of claim 1, wherein at least 70% of the cells exhibit
2 CD56 as a cell surface marker and have an insulin:actin mRNA ratio less than 1:100.

1 4. The cell culture of claim 1, wherein at least 90% of the cells exhibit
2 CD56 as a cell surface marker and have an insulin:actin mRNA ratio less than 1:1.

1 5. A cell culture of insulin producing cell aggregates, said cell culture
2 produced from the propagating pancreatic cells of claim 1, wherein at least 50% of the cells
3 exhibit CD56 as a cell surface marker.

1 6. A method of obtaining a culture of propagating pancreatic cells
2 comprising:

3 (a) isolating pancreatic cells from a pancreas;
4 (b) contacting the pancreatic cells with a CD56 binding reagent;
5 (c) selecting pancreatic cells that specifically bind to the CD56 binding
6 reagent; and
7 (d) separating the selected pancreatic cells from pancreatic cells that do not
8 bind the CD56 binding reagent to obtain a culture of propagating pancreatic cells.

1 7. The method of claim 6, wherein the CD56 binding reagent is labeled.

1 8. The method of claim 6, wherein the step of selecting is done by
2 fluorescence activated cell sorting.

1 9. The method of claim 6, wherein the step of selecting is done by
2 panning.

1 10. The method of claim 6, wherein the CD56 binding reagent is an
2 antibody that specifically binds to the CD56 protein.

1 11. The method of claim 10, wherein the CD56 binding reagent is an
2 antibody that specifically binds to an oligosaccharide linked to the CD56 protein.

1 12. The method of claim 6, wherein the CD56 binding reagent is a lectin
2 that specifically binds to an oligosaccharide linked to the CD56 protein.

1 13. The method of claim 6, wherein the CD56 binding reagent is a ligand
2 of the CD56 protein.

1 14. The method of claim 13, wherein the ligand is selected from the group
2 consisting of soluble CD56, heparin, and heparin sulfate.

1 15. The method of claim 6, wherein the pancreas is from a human.

1 16. The method of claim 6 which further comprises propagating the cells
2 of step (d) and differentiating the cells into an aggregate of insulin producing cells.

1 17. The method of claim 16, wherein the step of differentiating the cells
2 comprises culturing the cells on plates coated with collagen IV.

1 18. The method of claim 16, wherein the step of differentiating the cells
2 comprises culturing the cells in a media comprising a differentiation factor.

1 19. The method of claim 18, wherein the differentiation factor is selected
2 from the group consisting of hepatocyte growth factor, keratinocyte growth factor, and
3 exendin-4.

1 20. The method of claim 18, wherein the differentiation factor is
2 hepatocyte growth factor.

1 21. A method of producing an aggregate of insulin producing pancreatic
2 cells comprising the steps of :

- 3 (a) isolating pancreatic cells from a pancreas;
- 4 (b) contacting the pancreatic cells with a CD56 binding reagent;
- 5 (c) selecting pancreatic cells that specifically bind to the CD56 binding
- 6 reagent;

7 (d) separating the selected pancreatic cells from pancreatic cells that do not
8 bind the CD56 binding reagent to obtain a culture of propagating pancreatic cells; and
9 (e) differentiating the propagating pancreatic cell culture into an aggregate of
10 insulin producing pancreatic cells.

1 22. The method of claim 21, wherein the CD56 binding reagent is labeled.

1 23. The method of claim 21, wherein the step of selecting is done by
2 fluorescence activated cell sorting.

1 24. The method of claim 21, wherein the step of selecting is done by
2 panning.

1 25. The method of claim 21, wherein the CD56 binding reagent is an
2 antibody that specifically binds to the CD56 protein.

1 26. The method of claim 25, wherein the CD56 binding reagent is an
2 antibody that specifically binds to an oligosaccharide linked to the CD56 protein.

1 27. The method of claim 21, wherein the CD56 binding reagent is a lectin
2 that specifically binds to an oligosaccharide linked to the CD56 protein.

1 28. The method of claim 21, wherein the CD56 binding reagent is a ligand
2 of the CD56 protein.

1 29. The method of claim 28, wherein the ligand is selected from the group
2 consisting of soluble CD56, heparin, and heparin sulfate.

1 30. The method of claim 21, wherein the pancreas is from a human.

1 31. The method of claim 21, wherein the step of differentiating the cells
2 comprises culturing the cells on plates coated with collagen IV.

1 32. The method of claim 21, wherein the step of differentiating the cells
2 comprises culturing the cells in a media comprising a differentiation factor.

1 33. The method of claim 21, wherein the differentiation factor is selected
2 from the group consisting of hepatocyte growth factor, keratinocyte growth factor, and
3 exendin-4.

1 34. The method of claim 21, wherein the differentiation factor is
2 hepatocyte growth factor.

1 35. A method of providing pancreatic endocrine function to a mammal in
2 need of such function, the method comprising the steps of:

- 3 (a) isolating pancreatic cells from a pancreas;
- 4 (b) contacting the pancreatic cells with a CD56 binding reagent;
- 5 (c) selecting pancreatic cells that specifically bind to the CD56 binding
6 reagent;
- 7 (d) separating the selected pancreatic cells from pancreatic cells that do not
8 bind the CD56 binding reagent to obtain a culture of propagating pancreatic cells; and
- 9 (e) implanting into the mammal the propagating pancreatic cells in an amount
10 sufficient to produce a measurable amount of insulin in the mammal.

1 36. The method of claim 35, wherein the CD56 binding reagent is labeled.

1 37. The method of claim 35, wherein the step of selecting is done by
2 fluorescence activated cell sorting.

1 38. The method of claim 35, wherein the step of selecting is done by
2 panning.

1 39. The method of claim 35, wherein the CD56 binding reagent is an
2 antibody that specifically binds to the CD56 protein.

1 40. The method of claim 35, wherein the CD56 binding reagent is an
2 antibody that specifically binds to an oligosaccharide linked to the CD56 protein.

1 41. The method of claim 35, wherein the CD56 binding reagent is a lectin
2 that specifically binds to an oligosaccharide linked to the CD56 protein.

1 42. The method of claim 35, wherein the CD56 binding reagent is a ligand
2 of the CD56 protein.

1 43. The method of claim 42, wherein the ligand is selected from the group
2 consisting of soluble CD56, heparin, and heparin sulfate.

1 44. The method of claim 35, wherein the pancreas is from a human.

1 45. The method of claim 35, wherein the mammal is a human.

1 46. The method of claim 35, wherein the propagating pancreatic cells
2 differentiate into aggregates of insulin producing pancreatic cells after implantation into the
3 mammal.

1 47. The method of claim 35, wherein before implantation into the
2 mammal, the propagating pancreatic cell culture is differentiated into an aggregate of insulin
3 producing pancreatic cells.

1 48. The method of claim 47, wherein the step of differentiating the cells
2 comprises culturing the cells on plates coated with collagen IV.

1 49. The method of claim 47, wherein the step of differentiating the cells
2 comprises culturing the cells in a media comprising a differentiation factor.

1 50. The method of claim 47, wherein the differentiation factor is selected
2 from the group consisting of hepatocyte growth factor, keratinocyte growth factor, and
3 exendin-4.

1 51. The method of claim 47, wherein the differentiation factor is
2 hepatocyte growth factor.

1 52. The method of claim 47, wherein the mammal is a human.

1 53. A method of monitoring a culture of propagating pancreatic cells by
2 a) contacting the pancreatic cells with a CD56 binding reagent; and
3 b) determining the quantity of cells that exhibit CD56 as a cell surface
4 marker.

1 54. The method of claim 53, wherein the detecting step is done by
2 fluorescence activated cell sorting.

1 55. The method of claim 53, wherein the CD56 binding reagent is an
2 antibody that binds specifically to the CD56 protein.